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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,890	06/19/2001	Kazuoki Matsugatani	09952/058001 / 56782-US-K	4513
27572	7590	03/07/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			AHN, SAM K	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

58

<b>Office Action Summary</b>	Application No. 09/885,890	Applicant(s) MATSUGATANI ET AL.	
	Examiner Sam K. Ahn	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8, 11, 12, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 11, 12, 19 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on 01/06/06 have been fully considered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. USP 6,115,426 (Fujimoto, cited previously) in view of Ando US 6,275,552 B1.

Regarding claim 11, Fujimoto teaches a communication device using a communication method of simultaneously transmitting and receiving a plurality of N carriers to receive known signals by K ( $\leq N$ ) carriers among the N carriers, the device comprising:

a transmitter unit for transmitting known signals (reference signal, note col.8, lines 62-67) and data transmission signals (data sequence, note col.8, lines 62-63) having a guard interval added thereto (see Tg in Fig.5);

means for determining (4 in Fig.1) from the received known signals an amount of shift of amplitude and phase of each of the K carriers (note col.8, lines 59-61)

indicative of the known signal (reference signal) to determine delay information of receiving radio waves in response to thus determined amount of shift (note col.8, lines 48-55); and a time setting unit for setting a time of the guard interval in response to the delay information (note col.13, lines 12-17 and 40-47).

However, Fujimoto does not explicitly teach wherein known signals and data transmission signals each having a guard interval, wherein the first guard interval is longer than the second guard interval.

Ando teaches inserting a first guard interval ( $t_3$ ) between a first data (MDC in Fig.10) and a second data (ACKC) followed by a second guard interval ( $t_4$ ), wherein the first guard interval is longer than the second guard interval (having 15 bits compared to 5 bits).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add guard interval between different data or signals. Applicant has not disclosed that first guard interval for the known signals and the second guard interval for the data transmission signals wherein the first guard interval is longer than the second guard interval provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well by incorporating the teaching of Ando of adding guard interval between the known signals (reference signals) and data transmission signals (data sequence) wherein each has a guard interval of 15 bits and 5 bits, respectively because it allows a transmission slot to have a certain desired length (note col.9, lines 29-31

of Ando). Furthermore, it is well known to one skilled in the art of adding guard intervals prevents signals from being distorted (note col.13, lines 44-47 of Fujimoto). The downfall of having lengthy guard interval is the reduction of data transmission rate, since less data in the signals are transmitted due to the guard interval bits ( $t_3$  and  $t_4$  in Fig.10 of Ando by increasing the guard interval bits). Therefore, it would have been obvious to combine the teaching of Ando in the system of Fujimoto by inserting a desired amount of guard interval to the known signals and the data transmission signals to one of ordinary skill in this art to obtain the invention as specified in claim.

Regarding claim 12, Fujimoto in view of Ando further teaches the transmitter unit transmits information signals together with the second guard interval as the data transmission signals, the second guard interval being added to a leading side of the information signal (see Fig.5 where  $T_g$ , guard time, is in the leading side of  $T_d$ , data); and the time setting unit sets, when the delay information calculating unit determines delay in a plurality of receiving radio waves as the delay information, the time of the second guard interval to a value longer than a maximum delay of delays in the plurality of receiving radio waves (note col.13, lines 12-17 and 40-47).

3. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. USP 6,115,426 (Fujimoto, cited previously) in view of Ando US 6,275,552 B1 and Alamouti et al. USP 5,933,421 (Alamouti, cited previously).

Regarding claim 19, Fujimoto in view of Ando teach all subject matter claimed, as applied to claim 11. However, Fujimoto in view of Ando do not explicitly teach the communication method is an orthogonal multiplexing carrier method.

Alamouti teaches the communication method is an orthogonal multiplexing carrier method (OFDM, note col.5, lines 21-29). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the teaching of Alamouti in the system of Fujimoto by implementing the modulation method using OFDM for the purpose of reducing inter-symbol interference, wherein OFDM is well-known in the art as having low inter-symbol interference.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto et al. USP 6,115,426 (Fujimoto, cited previously) in view of Ando US 6,275,552 B1 and Herring et al. US 6,958,987 B1 (Herring).

Regarding claim 20, Fujimoto in view of Ando teaches all subject matter claimed, as applied to claim 11. However, Fujimoto in view of Ando do not explicitly teach wherein the transmitter unit further transmits header signals including a third guard interval between the known signals and the data transmission signals, wherein the third guard interval is longer than the second guard interval.

Herring teaches transmission of known signal (Preamble, see Fig.9) followed by header signal (Header) and data transmission signal (DATA) in a sequence.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add guard interval between different data or signals. Applicant has not disclosed that transmitting known signal, header and data in a sequence each having a guard interval wherein the third guard interval is longer than the second guard interval provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well by incorporating the teaching of Herring in the system of Fujimoto in view of Ando of adding guard interval between the known signals (reference signals), header and data transmission signals (data sequence) wherein each has a guard interval of 15 bits, 5 bits, and other bits, respectively because it allows a transmission slot to have a certain desired length (note col.9, lines 29-31 of Ando). Furthermore, it is well known to one skilled in the art of adding guard intervals prevents signals from being distorted (note col.13, lines 44-47 of Fujimoto). The downfall of having lengthy guard interval is the reduction of data transmission rate, since less data in the signals are transmitted due to the guard interval bits ( $t_3$  and  $t_4$  in Fig.10 of Ando by increasing the guard interval bits).

Therefore, it would have been obvious to combine the teaching of Herring in the system of Fujimoto in view of Ando by inserting a desired amount of guard

interval to the known signals, header signal and the data transmission signals to one of ordinary skill in this art to obtain the invention as specified in claim.

***Allowable Subject Matter***

5. Claim 8 is allowed.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn  
3/4/06

A handwritten signature in black ink, appearing to read 'Jay K. Patel', with a long horizontal stroke extending to the left.

JAY K. PATEL  
SUPERVISORY PATENT EXAMINER